

June 4, 1995

**Memo re San Joaquin Valley Drainage as it
Relates to the Delta**

Introduction

The serious problem of low quality drainage from wetlands and farm lands on the westside of the San Joaquin Valley did not exist until the Delta Mendota Canal of the Central Valley Project went into operation in 1951. It is essential that there be a method of disposing of this drainage that will not damage Delta water quality. The failure to provide a non-damaging method of drainage disposal has resulted in a substantial drainage load entering the Delta via the San Joaquin River. A drainage system which kept the drainage out of the river and South Delta but which delivered it to the western Delta could also cause problems.

Background

The Delta Mendota Canal (DMC) delivers water for two purposes. Wetlands and farm lands that previously used high quality upper-San Joaquin River water were given imported Delta water to replace the upper-San Joaquin water which is exported south via the Friant Kern Canal. The DMC also delivers water to other lands that previously had no surface water supply. The DMC water is of good quality, but it contains about seven times as much salt as the very pure water which is exported from Friant.

The effect of this water trade and water importation is to also import about one million tons of salt per year from the Delta to the westside of the valley within

the San Joaquin drainage basin. The water is then applied to crops and wetlands which consume most of the water but leave almost all the imported salt in concentrated drainage water. Some of this drainage water is accumulated in valley groundwaters and the rest gets into the river via Salt and Mud Sloughs.

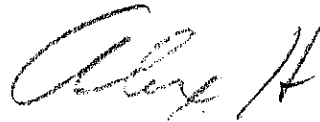
Most of the salt load in the drainage water came from the Delta via the canal, but it is concentrated to about ten times its former salinity. The problem with the drainage water is partly its very high salinity and partly the fact that it picks up small quantities of toxic ions from westside soils. Those soils derived from marine shales which contain traces of selenium and other metallic ions which are toxic when they are concentrated along with the concentration of imported salts. The imported salts would cause no problem if they were delivered into bay or ocean waters containing the same salts at the same or high concentrations. The problem is disposing of the entrained toxic ions either by removal or by dilution to very low, non-toxic concentrations.

There have been years wasted by procrastination with no viable long term solution.

Conclusion

The Delta Protection Commission should forcefully urge that the State insist on prompt development and implementation of a drainage disposal system which will stop the introduction of damaging drainage water to the South Delta and which will not permit the disposal of these drainage waters into the Delta at any point where the salts which originated in the Delta are returned at concentrations

higher than the receiving waters, and which will require that any toxic ions which originate in the valley are either first removed, or are reduced to concentrations meeting all applicable standards for protection of the estuary. So long as these conditions are met, the Commission should not prejudge the acceptability of proposals which have yet to be developed. These proposals may include segregation of drainage from different users with different compositions and disposal by different means.

A handwritten signature in dark ink, appearing to be "Alex H.", is centered on the page.

June 9, 1995

Information Which Further Explains the Discussion
in my June 4 Memo on Drainage

The attached map shows the San Joaquin drainage basin. It shows the location of the Delta Mendota Canal (DMC) which delivers water and salt to the west side of the drainage basin. It also shows Salt and Mud Sloughs. Most of the drainage which drains from the west side of the drainage basin flows first into Salt and Mud Sloughs and then into the river.

The amount of salt delivered into this drainage basin via the DMC since 1951 is shown on the attached graph labeled SDWA-WQCP-21.

Most of the salt which drains into the river is the same as the salt that was imported by the DMC, but it is much more concentrated when it reaches the river. To show that this is the case we "finger printed" the salt by measuring its chemical composition. We then measured in the DMC and in the river the quantity of each of the ions that are major constituents of the DMC salt load. The attached diagram labeled SL9 shows, for example, that almost 80,000 tons of sulfate ion was imported by the DMC in 1960-61 and that almost 50,000 tons of this ion came back down the river and into the Delta. The same pattern can be shown for each of the major ions in the DMC salt load. The entrained selenium and other metallic ions which are leached from west side soils can be a big problem, but they are a very small part of the salt load. These metallic ions are all found in sea water at very low concentrations, which is why they are in the west side soils that were derived from marine shales.

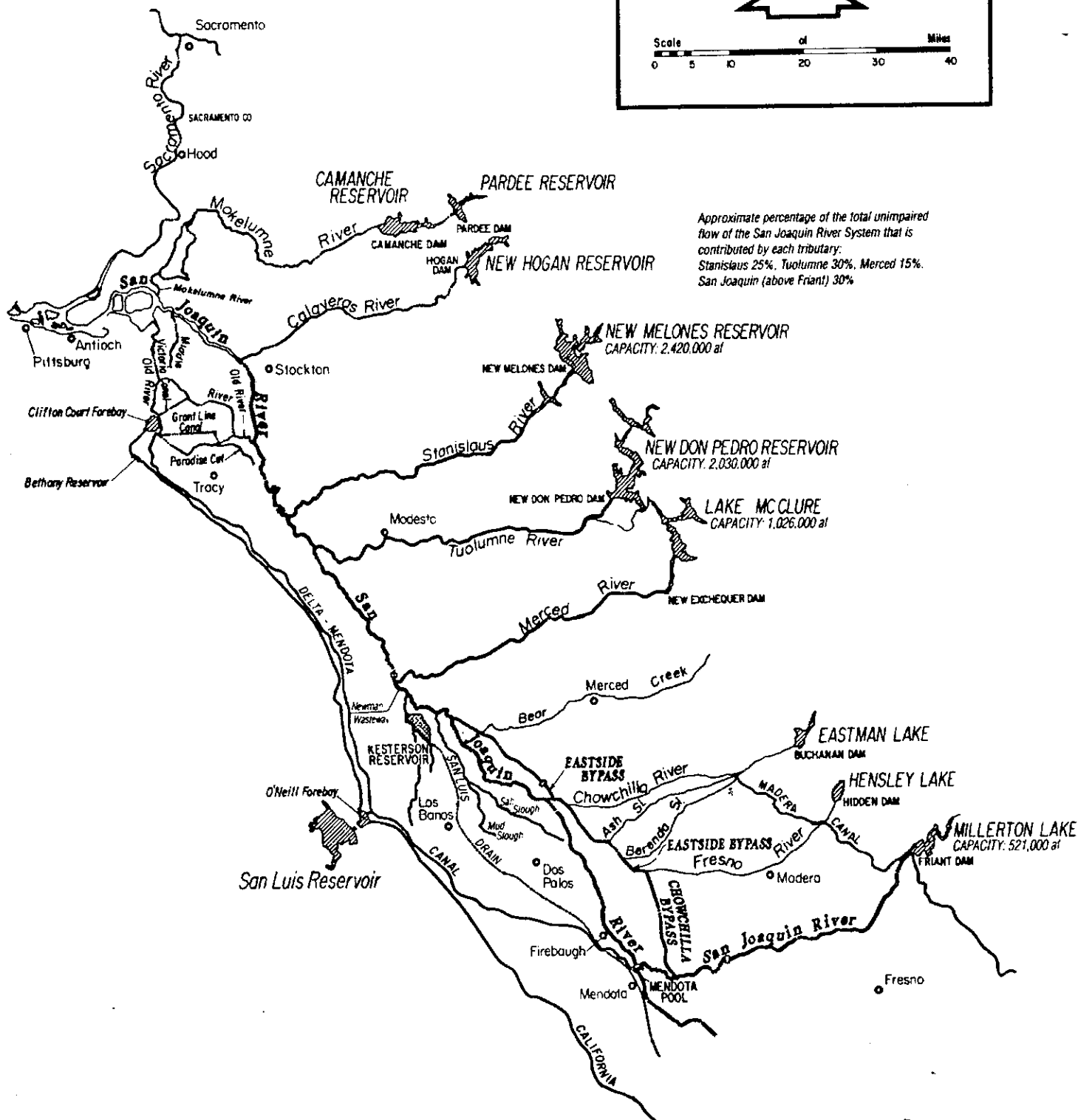
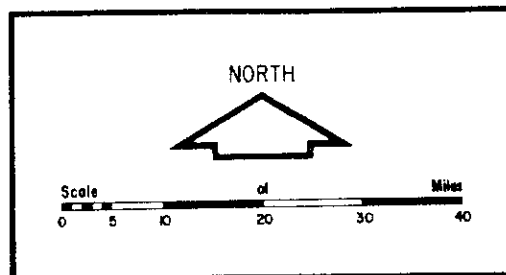
Since the toxic ion problem became fully understood, there has been no adequate attempt to segregate the drainage which contains most of these ions so that the rest of the drainage can be disposed of by one system, and the toxic drainage then treated for ion removal, or conversion to solid salt for non-damaging storage, or segregated and perhaps reduced in volume for transportation to an ocean location where it can be diluted to the concentration of those ions that is found in the ocean, or some combination of methods.

Stopping the drainage by shutting down the food production of a million acres of prime agricultural land is not much more feasible or desirable with our growing population than shutting off the sewage effluent from the City of Sacramento. The Delta can only be protected from damage from this drainage by insisting on provision of a multi-faceted, non-damaging drainage disposal system. The notion that the drainage can be kept in the valley is pure nonsense.

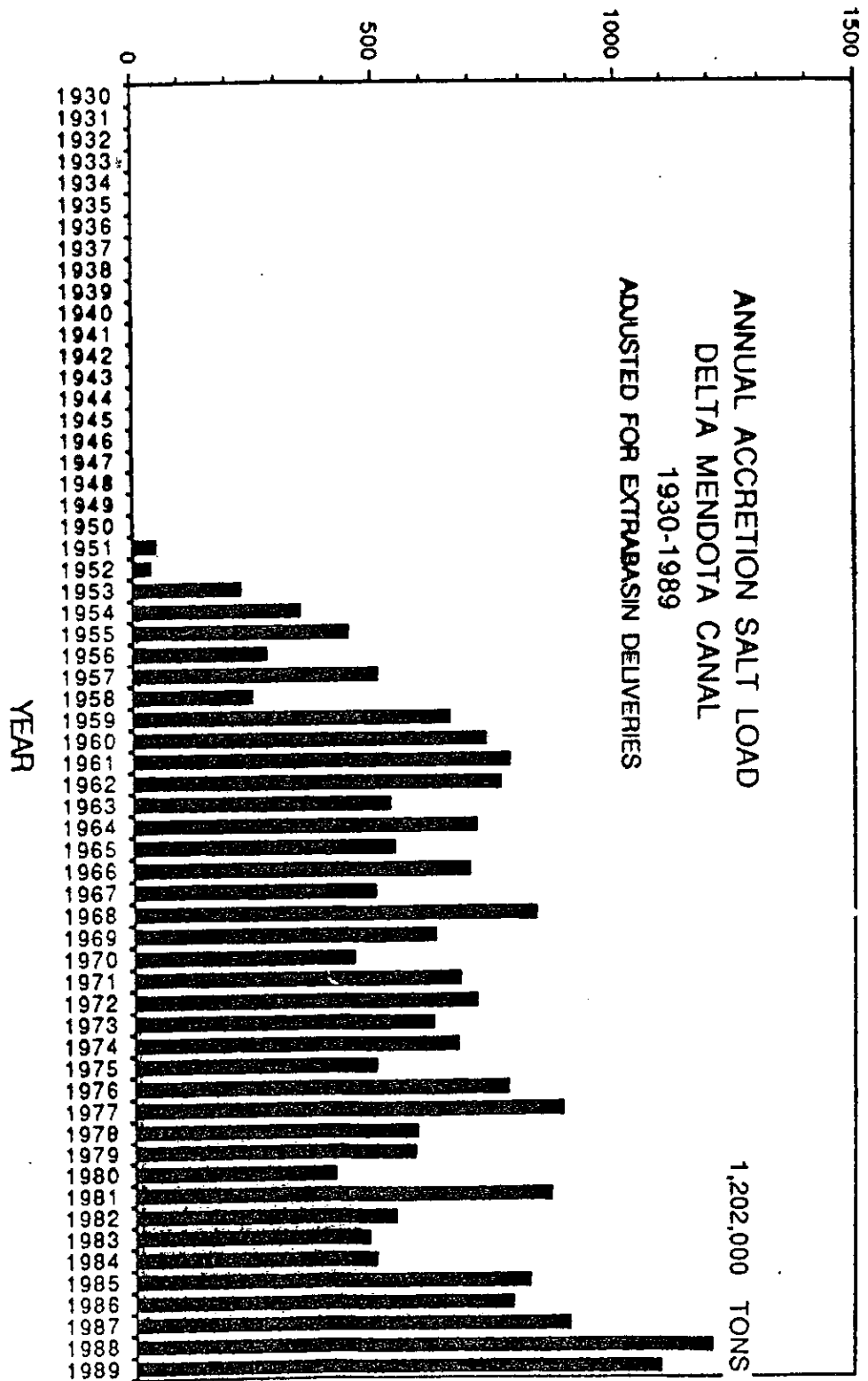
In the interim it is important that the drainage be controlled so that it enters the river primarily when river flows are available (fish or power releases or DMC releases to the river, or high tributary flows) to dilute the drainage as much as possible. There are ways that this can be done at reasonable cost, but the Regional Water Quality Control Board has, so far, refused to require it.

Alex Hildebrand

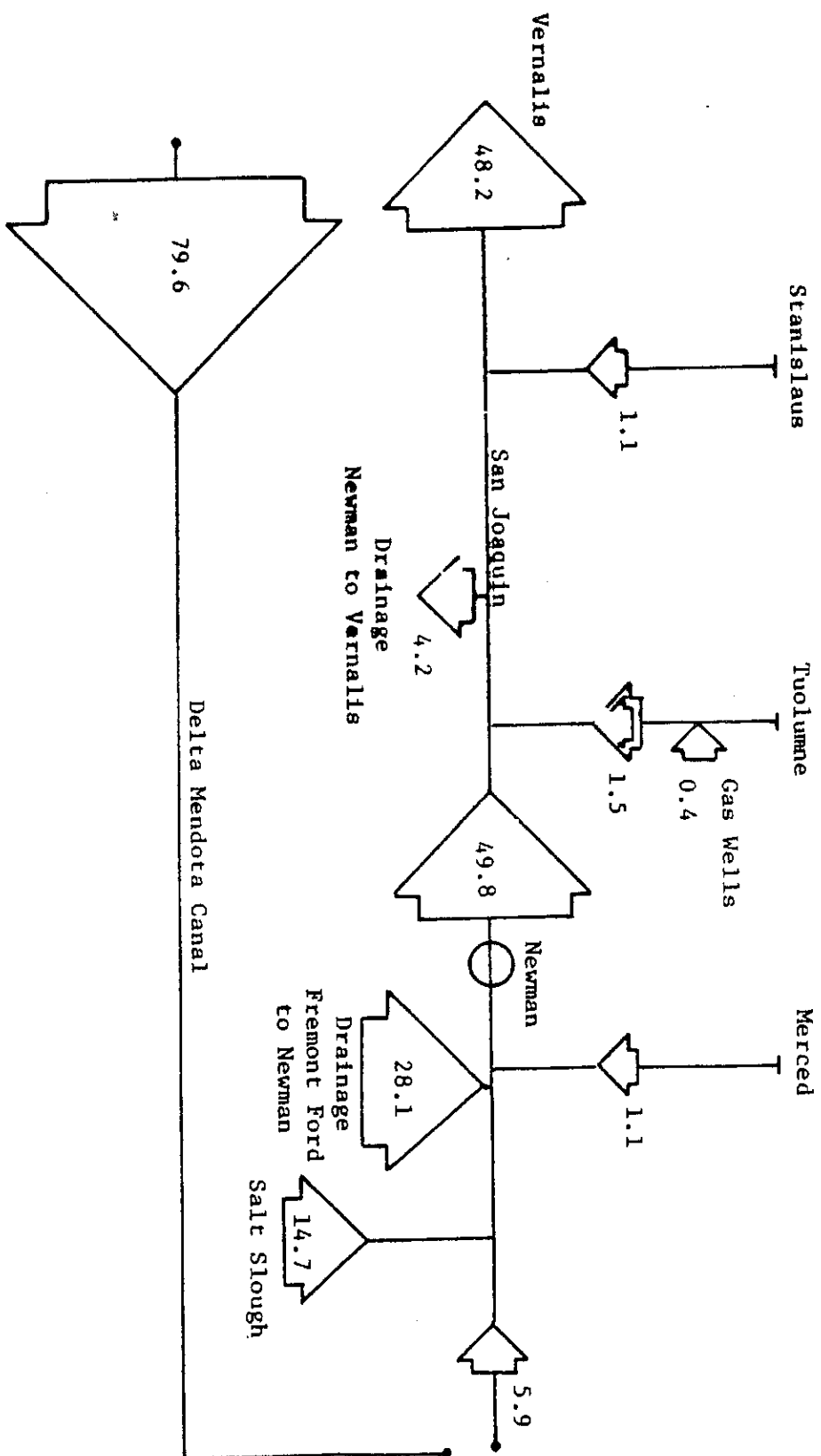
SAN JOAQUIN SYSTEM



ANNUAL SALT LOAD, 1000 TONS



GTO 8/90



SULFATE SALT BALANCE FOR SAN JOAQUIN RIVER SYSTEM, 1960-61

(Numbers indicate salt load in thousand tons per year)